

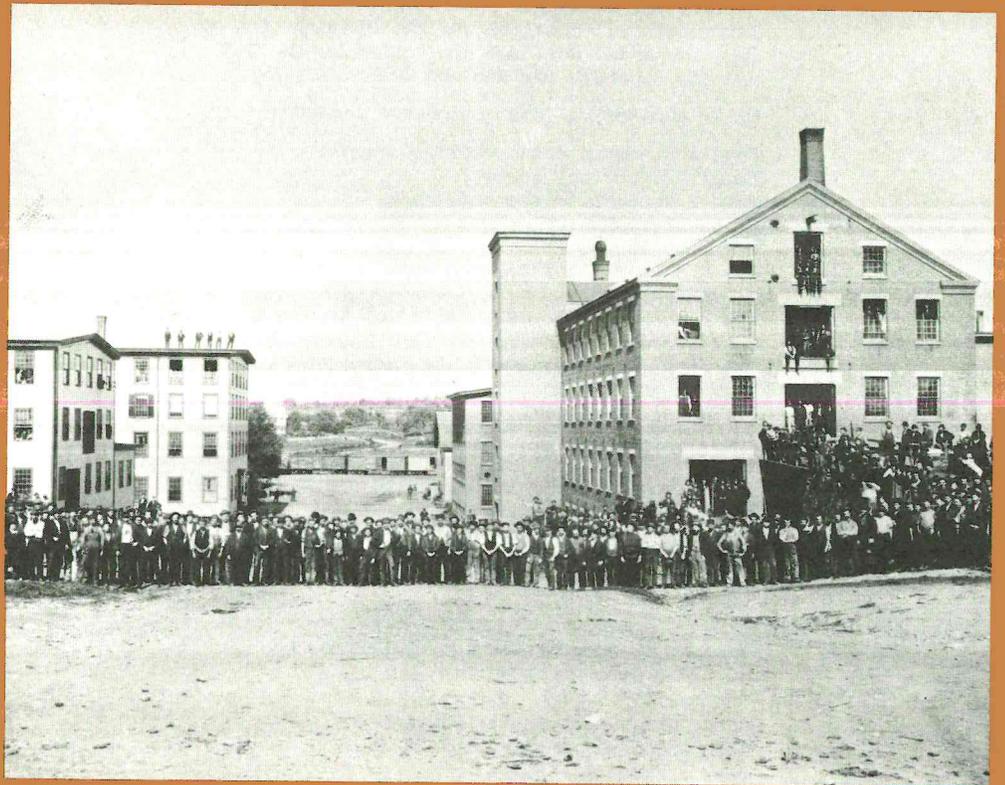
# Industrial Heritage '84



## New England



The Fifth International Conference  
on the Conservation of the Industrial Heritage



# Guidebook

Merrimack Valley  
Excursion

Paul Hudon

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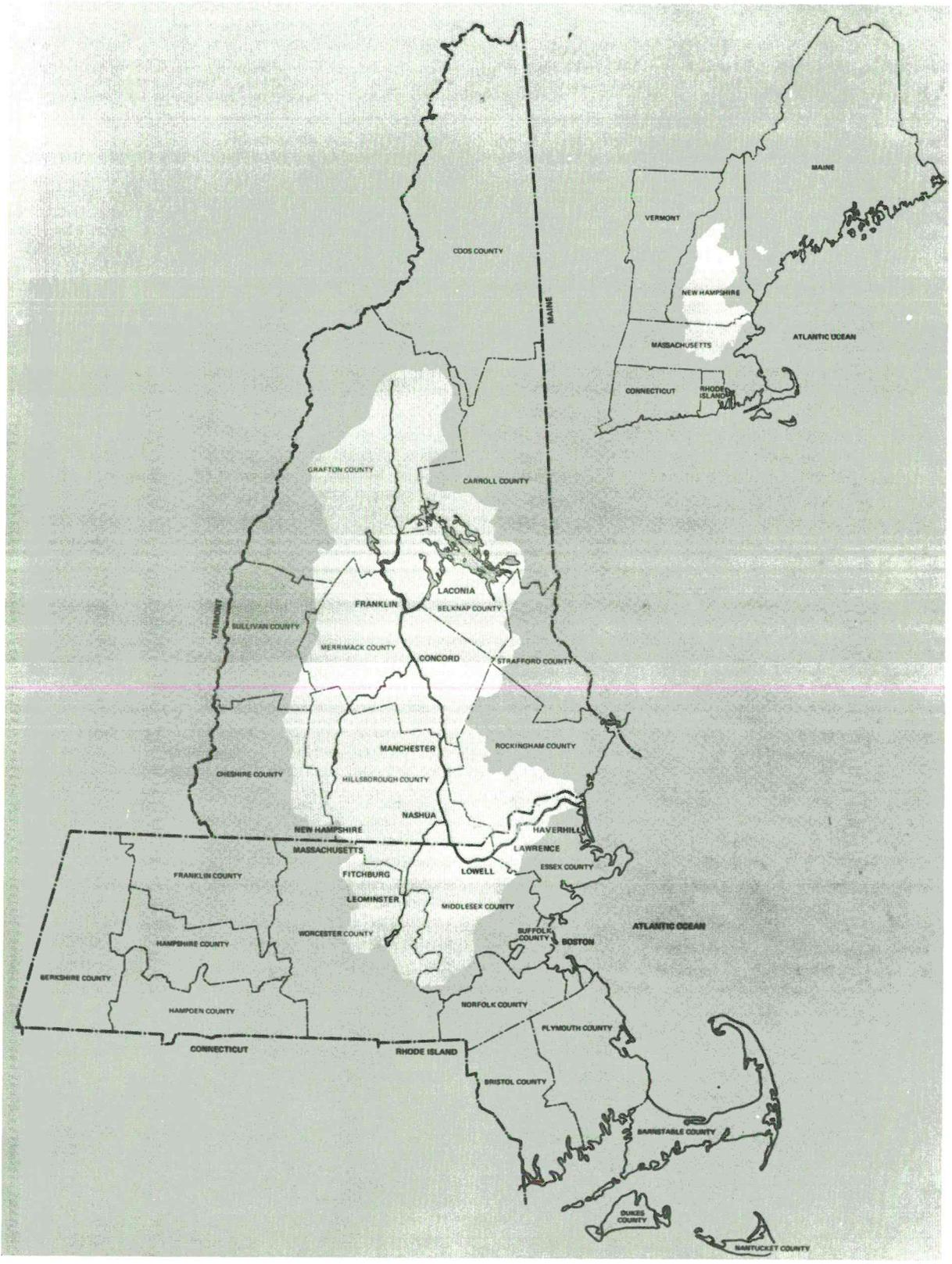
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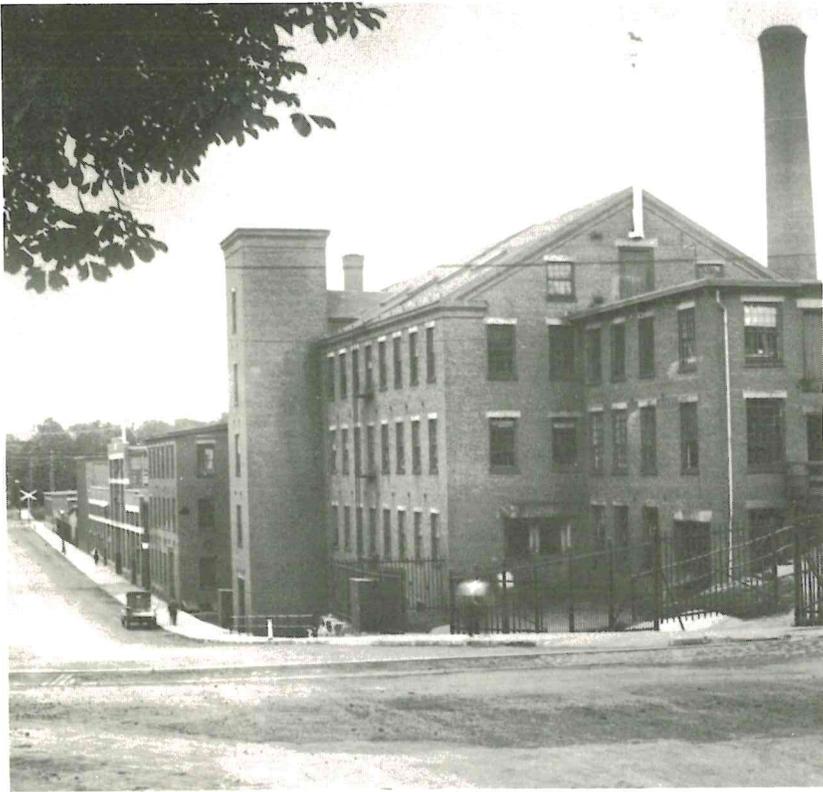
**Cover:** This photo of the labor force at Davis and Furber was taken in 1870, ten years after the construction of the brick shop. It makes the point, rather directly, that in contrast to the textile mills, the machine shops were dominated by male labor.

The second largest river system in New England, the Merrimack drains over 5,000 square miles of New Hampshire and Massachusetts. The map shows the area of the valley, the course of the river, and the principal cities along it. (The Merrimack: Designs For a Clean River, 1971).



## INTRODUCTION - MERRIMACK VALLEY TOUR

The valley of the Merrimack River is quite obviously marked by the material heritage of industrial production. This heritage, generated by revolutionary technology in textiles, is most often celebrated at Lowell, and 1821 is taken for the starting date; both place and time, however, are symbols only. When Pawtucket Falls was "discovered" in November 1821, other Yankee entrepreneurs -- and some few English immigrant machinists -- had already been more than a decade at using the many falls along the tributaries of the Merrimack. The first generation of carding engines and spinning frames in the valley were turned by the waters of the Powow (Amesbury/Salisbury), the Shawsheen (Andover), the Little River (Haverhill) and the Concord (Chelmsford). Even today a tour of industrial sites in the Merrimack Valley will show the traces of a style and a period of textile manufacturing which antedates the enormous production complexes installed at Lowell, Lawrence, and Manchester. The difference of scale between these giants and the earlier "mill villages" is only the most obvious difference between them. All the differences between them rested on the evolution of technology, to be sure. Yet all the changes made possible by technology were not for that reason made necessary, and, certainly, they were not made inevitable.



A view down Elm Street with a portion of the Davis and Furber Shop as it looked during the 1920s.

Today it is the technology of information and communication which employs the larger part of capital and labor in the cities on the Merrimack. Lowell and Lawrence, in Massachusetts, Nashua and Manchester, in New Hampshire, are cites formerly busy at making other products -- usually textiles -- now engaged in the manufacture of computers.

The social, fiscal, and political changes brought by industry relied less directly on technology than on the decisions made by the persons who came to own the technology. This is no less true of contemporary production than it was in the mill villages of 1820 and the giant structures of 1910.

### 1. NORTH ANDOVER, MASSACHUSETTS

Although a short stream, Cochichewick Brook in North Andover offers a drop of nearly 75 ft. (22.5 m), and behind that there is Great Pond (or Lake Cochichewick), a plentiful reservoir to ensure steady power. The first European to see it knew enough of the simple technology of the seventeenth century -- hydraulics and its relation to mechanical power -- to see the great asset the Brook might become. When English settlers founded Andover (1646), they located their meetinghouse near the Brook and, as they intended, the precinct became the town center. The area is still identified as "the Old Center" by many. From the first generation of settlement by Europeans, the Brook was the site of gristmills and mills for fulling homespun woolens. It was James Scholfield, an English immigrant of another generation, who first used the falls on Cochichewick to power machines for carding the wool of local farm families. That was in 1802. Within thirty years the entire power available from the Brook had been divided among four enterprises; three of them made cloth and the fourth, Davis and Furber, as the company came to be called, manufactured the machines that made the cloth. Davis and Furber made woolen machinery at the site, at the corner of Elm and Water Streets, from 1836 to 1892, and it constructed a number of workers' houses immediately surrounding the shop. The whole is still remarkably intact, at least architecturally. A visit to Machine Shop Village offers the opportunity to survey the evolution of industrial architecture from 1840 to 1920, and to see a relation between workplace and living place rather common along the smaller streams of the Merrimack Valley.

### 2. LAWRENCE, MASSACHUSETTS

For the industrial archeologists, the City of Lawrence is not one site, but two. The "original" or "older" was created under the directions of the Essex Company, founded in 1845. The "newer" city was built in the opening decade of this century, chiefly under the promotion of the American Woolen Company (1899).

The most original feature of the "first" city is still the most visible feature of its

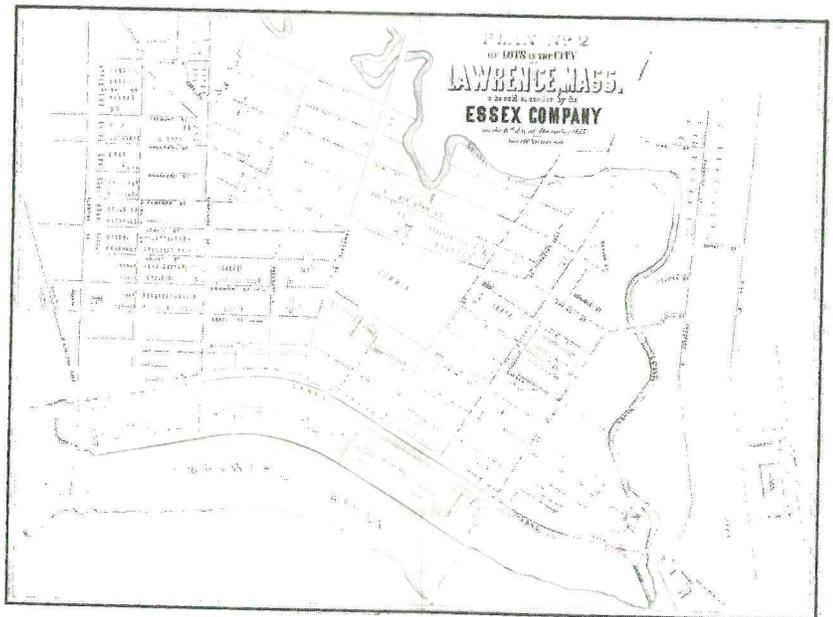
landscape. This is the power system—dam and canal—built between 1845 and 1848. The Great Stone Dam has never needed repair, and since August, 1981, it has pooled the water to drive the hydroelectric turbines on its southern side. At the opposite side, is the head of the North Canal and its fine gatehouse (1848). The granite structure which housed the Lawrence Machine Shop, in the Millyard of the Everett Properties on Union Street, (1847) is a third feature which remains of the "original" city, and it underscores the point that waterpower makes location the prime consideration. For the Machine Shop was located at a unique juncture of the power system, where water may be dropped from the North Canal into the Spicket River. The Essex Company thus preserved the entire power island for paying tenants.

By contrast, the enormous mills built between 1901 and 1910 used steam to power their machinery, and ignored the waterpower developed half a century earlier. Two of these, the Wood Mill (1906) and the Ayer Mills (1909) at South Union and Merrimack Streets, were located on the southern side of the Merrimack. They were operated by the American Woolen Company, but other corporations at Lawrence also expanded production during that decade. The Pacific Mills, on Canal Street, the Arlington on Broadway, and the Everett on Union Street were begun in the nineteenth century, but kept pace with the accelerated construction and production schedules of the twentieth. The mills at Lawrence were in operation until the middle of this century. Most are now tenanted to manufacturing unrelated to textiles. The former Wood mill is now one plant operated by the Honeywell Corporation.

The small stone storehouse, at the corner of Marston and Canal Streets, is the only surviving structure of the Russell Paper Company. William Russell began papermaking in 1853 (the year Lawrence was granted its city charter), at the place where the Spicket River and the North Canal empty into the Merrimack. Russell soon expanded production and erected buildings on both sides of the Spicket (see photo of Plan No. 2). He built his home just north of the mills, on Prospect Hill where Charles S. Storrow, Chief Planner of the Essex Company had resided. In 1900 the heirs of William A. Russell, son of the founder, sold the company to Champion International which continued to make paper in buildings of their own construction until the 1950's. Ravaged by fire in 1973, it is the shell of these buildings that stand -- just barely--at the site. The former Russell estate on Prospect Hill is now occupied by the Lawrence General Hospital.

Few structures in the city have undergone extensive restoration. One of these is the so-called Mechanics' Block bounded by Orchard, Union, Garden and Newbury Streets, built in the later 1840's for the skilled labor force collected to work at the Machine Shop. There are two workers' boardinghouses of the same period still standing at Lawrence, and the one at Jackson and Canal Streets will soon be rehabilitated to serve as the Visitor Center of the city's Heritage State Park. Massachusetts is the first state of the Union to undertake

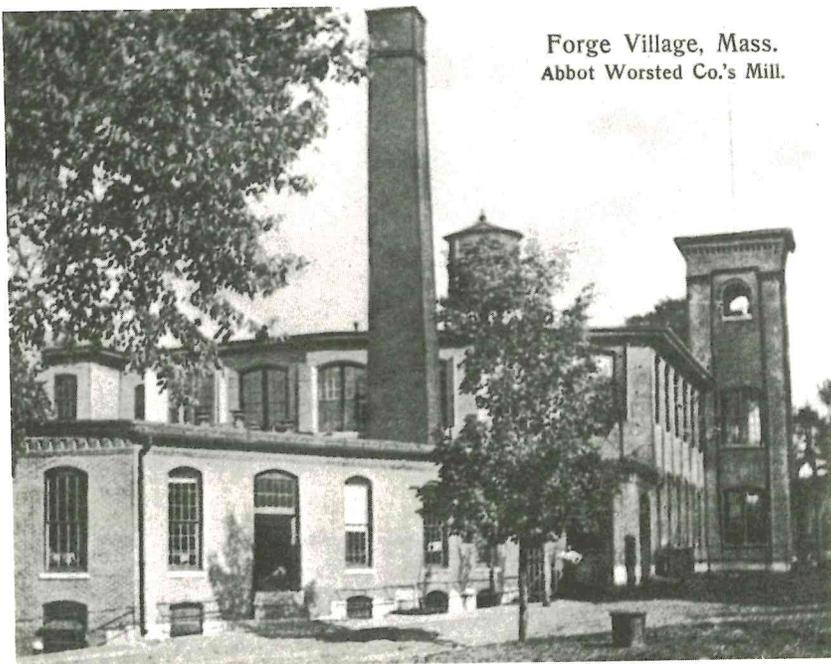
such a system of urban parks, designed to interpret the industrial heritage of the state and to form a basis for the revitalization of its historic cities. The theme of the park at Lawrence will honor the role of immigrant labor in the building of American power by recollecting the efforts of the workers from 52 nations who toiled in the mills of the city. The Heritage State Park is administered by the Massachusetts Department of Environmental Management.



This aerial view of Lawrence looks west, against the current of the Merrimack, on the right we can trace the course of the North Canal while, on the left, we see the giant structures built on the river's south side between 1900 and 1910. The land below Interstate 495 and the river is North Andover. (The Merrimack: Designs For a Clean River, 1971).



Constructed of coursed granite rubble, this building was completed in 1878. For nearly a century, it was the C.G. Sargent Machine Shop at Graniteville.



Forge Village, Mass.  
Abbot Worsted Co.'s Mill.

### 3. ALONG STONYBROOK IN MASSACHUSETTS

Moving west from Lowell, we encounter the towns of Chelmsford, Westford, Groton and Pepperell. Like all of the region of the lower Merrimack, this area was settled by English Puritans in the years between 1635 and 1675. For a century and a half these towns were largely agricultural: the Lawrence Brothers -- William, Amos, Abbott, Luther, Samuel -- were the sons of a prosperous Groton farmer before beginning their careers as merchants and industrialists. On Stonybrook (Chelmsford and Westford) and on the Nissittissit River (Groton) these farmers built gristmills, sawmills, and fulling mills.

The area changed rapidly in the opening decades of the nineteenth century with the introduction of the period's growth industry, machine technology and machine production. In the mid-1820s General Shepard Leech, of Easton, Massachusetts, developed a site on Stonybrook at North Chelmsford. The site is presently occupied by the Gilet Wool Scouring Company. Leech built a dam and canal and operated a foundry to which he later added a machine shop. In succeeding years (1834-1849) the machine shop came under the control of Ira and Ziba Gay and Harvey Silver. Operated as Gay and Silver until 1890, the shop was the manufacturer of machine tools, water turbines, and textile machinery considered among the finest in the United States. Today, the buildings, at 70 Princeton Street, are occupied by Wang Laboratories.

Stonybrook also turned the wheels of textile operations at Graniteville and Forge Village, two "mill villages" in the town of Westford. Yet another machine shop, that of C.G. Sargent, on Broadway Street has been in production at Graniteville since 1854, and, for a time, it shared its space with the Abbott Worsted Mills, at the corner of North and Broadway Streets. Sargent was also a partner of that corporation. Both machine building and yarn spinning prospered so that the two businesses were separated in 1877. While continuing production at Graniteville, the Abbott Company expanded further by moving somewhat upstream on Stonybrook to what was already called Forge Village, at the corner of Pleasant and Prescott Streets. There, steam was the primary source of power. Production at Forge Village began in 1879 and continued until 1958. During the 1930s, the Abbott Worsted Company employed about 800 people at these two sites and were the largest producers of worsted yarn in the world. No weaving was ever done at either site.

As the name Graniteville suggests, and as some of the remaining industrial structures show, Chelmsford and Westford were also the site of quarries.



This postcard view of the Bigelow Carpet Company was likely taken between 1890 and 1910. An interesting note is that the American Flag was added by the patriotic publisher of the card.

#### 4. CLINTON, MASSACHUSETTS

Clinton is on the Nashua River, a stream that runs south to north, as do several of the tributaries of the Merrimack on its western side. Like Lawrence, Clinton is seven square miles in area, and like Lawrence, it was incorporated as a manufacturing city in the middle of the nineteenth century on land taken from an agricultural town settled two centuries before. Unlike Lawrence, however, Clinton was not created in the image of the Boston Associates; it was not conceived as one corporation's scheme for site development, on the pattern of Lowell. Rather, Clinton emerged piece-meal on the technical and business capacities of one individual, Erastus Brigham Bigelow (1814-1879).

Bigelow was born at West Boylston, a village at the headwaters of the south branch of the Nashua River, and there he may have acquired his interest in machines and mechanics for his father was a wheelwright and chairmaker, as well as a farmer. Erastus Bigelow achieved instant prominence when he invented a power loom for weaving coach lace in 1837, and it was for the production of that fabric that The Clinton Company was organized in the following year. It

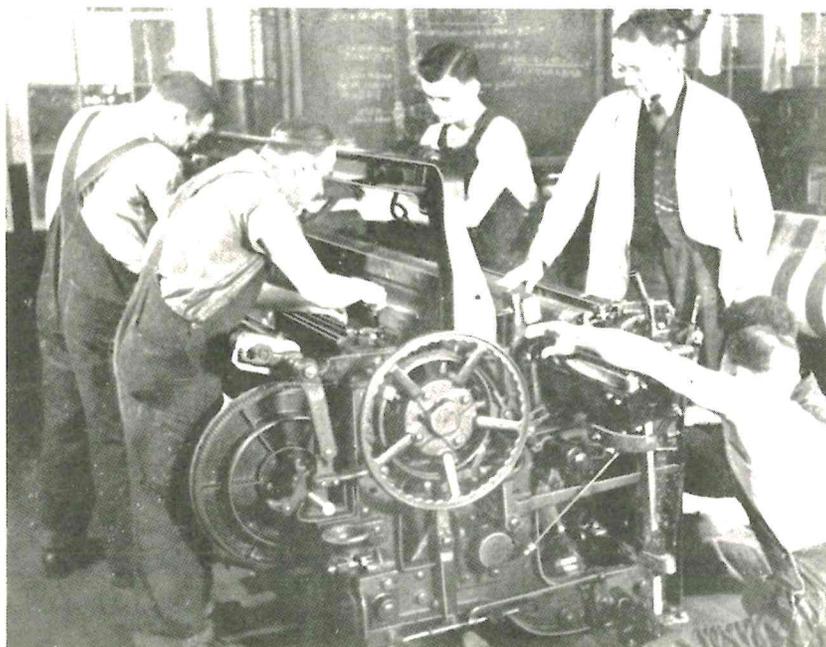
was this first loom that Bigelow later elaborated and brought to perfection in several versions as machines to weave carpets of various sorts. Also, he improved other looms for the manufacture of figured cloths: counterpanes, ginghams, silk brocatels, pile fabrics, and wire cloth. Frustrated in his ambition for a literary or medical education, Bigelow achieved an international reputation as a mechanic, largely self-taught. Bigelow was an incorporator of the Massachusetts Institute of Technology.

The Lancaster Mills, on Green Street, making ginghams, and the Bigelow Carpet Mills at Union and School Streets, were the two principal employers of the city. As in all the textile cities in the Merrimack Valley, the workforce at Clinton became dominated by immigrant labor. In 1900, with a population of 13,667, there were 5,504 foreign born residents at Clinton.

Clinton is also the site of Wachusett reservoir, Routes 62 and 70, created by the building of a dam across the south branch of the Nashua in the years from 1896 to 1905. The reservoir is over thirty-two miles in circumference and may hold 63,000 million gallons of water for the use of metropolitan Boston.



This view shows the Nashua Manufacturing Company as it would have looked during the years of the Great War, when the cities on the Merrimack reached their peak in the production of textiles. Today the canal in the view has been filled in, and the space used for parking automobiles.



Here we have a group of apprentice loomfixers at the Nashua Manufacturing Company (ca 1930). The instructor has put on a white laboratory jacket to telegraph the fact that under it he wears the garb of the managerial class.

## 5. NASHUA, NEW HAMPSHIRE

Our route to Manchester allows a drive through Nashua, for more than a century the second largest city in New Hampshire. Located at the confluence of the Nashua River with the Merrimack, the site offers considerable water power in the last three or four miles of its course. Nathan Appleton, in fact, recorded that he and his associates narrowly missed the site in September, 1821, while on the search which brought them to the Pawtucket Falls two months later. The oversight was doubtless a lucky one, since Pawtucket Falls yielded ten or twelve times the magnitude of power given by the Nashua. Nethertheless, the oversight was quickly repaired. Two years later (1823), the first of the city's textile manufacturers -- called the Nashua Manufacturing Company, on the Pine Street Extension -- was incorporated. Two more corporations, the Jackson, on Canal Street and the Harbor manufacturing companies, were soon added to this one. In 1860 these three together produced twenty million yards (18 million m) of cotton goods. By then the population of Nashua was 10,165 of whom 1,500 were textile workers and another 1,000 were employed in other manufactures.

In 1837, John H. Gage founded a shop which in later years laid claim to being the first in the United States devoted exclusively to the making of machinists' tools. Operating as the partnership of Gage, Warner & Whitney (1851), it produced lathes for every market, from watchmakers to the makers of steam locomotives. They also made gear cutting machines, bolt-cutting machines, boring machines, and other tools of the machinist's trade. Meanwhile, the Nashua Lock Company (1837) and the Nashua Iron Company (1848) were contributing to the town's reputation for metallurgy and machine skills.

Along with many other towns and cities in southern New Hampshire, Nashua has enjoyed remarkable prosperity since the mid 1960s. Sustained by the growth of the electronic industries, the city has virtually ignored the recession in the many other regions of the nation.

## 6. MANCHESTER, NEW HAMPSHIRE

The site of Manchester, below the Amoskeag Falls of the Merrimack River, was settled by Scotch-Irish and English farmers during the 1730's. The settlement was named Derryfield. In 1794 Judge Samuel Blodget began the construction of a dam and transportation canal around the Falls, on the east bank of the river, but due to many difficulties, it did not begin operation until 1807. Several small grist and saw mills built nearby were among the first mills to harness the power of the mighty Merrimack. In 1809 a small cotton mill was built, and the citizens renamed the town Manchester, in the expectation that their village would soon rival the large English mill town. For the next 20 years this optimism appeared to be misplaced. A lack of funds prevented any large expansion. Then, in 1831, a

group of investors from Massachusetts and Rhode Island chartered the Amoskeag Manufacturing Company, and by 1838 the Company's owners included many of the owners of the mills and canal system at Lowell. This influx of capital led to the rapid expansion of Manchester as a planned manufacturing community modeled on the successful example of Lowell.

As at Lowell, and later at Lawrence, one company owned the water power, mill sites, and land for municipal development. The Amoskeag Company built the mills, workers' housing, and machinery for the textile corporations and rented the water power from the system it developed and maintained. The Amoskeag Company also operated its own textile mills in Manchester, a practice which was not followed by the developers at Lowell and Lawrence. By retaining corporate control, the Amoskeag exercised far greater power over the city of Manchester, leading to the development of an extremely paternalistic system destined to bring ruin to the city when the cotton mills failed in the 1930s.

Only fragments of the mills and water power system of Manchester survive, but even the remains are an impressive site, walls of brick lining the Merrimack River. In 1837-8, a masonry wing dam and the Upper Canal were built. The lower Canal was completed in 1845, and the dam was rebuilt in 1870. Having utilized practically all of the 19,000 gross horse power available in the canal system, the Amoskeag Company expanded to steam-powered mills built on the west bank of the river during the 1880s and 1890s. The Company erected hydro-electric stations on the Piscataquog as well as a large steam turbine generating station on the east bank of the Merrimack. In 1922 a new dam and hydro-electric station was built at the Amoskeag Falls, utilizing almost all of the water that had previously flowed through the canals. The Company also planned and constructed the city's streets and parks and sold land for residential and commercial development.

The labor force at Amoskeag, like that at Lowell and Lawrence, was characterized by its ethnic diversity. French-Canadian workers, however, formed the most numerous group. By 1910, they comprised 35% of the Amoskeag's work force and 38% of Manchester's population. Greeks and Poles also were represented in significant numbers. Corporate paternalism, seeking to avoid labor strife which was identified with foreign-born workers, developed welfare programs designed to "Americanize" the workers and keep them content with company policy and practices. Despite such attempts, a bitter ten-month strike erupted in 1922 which was the beginning of the end for the corporate giant. For a decade after 1922, Manchester, like other New England cities, witnessed the steady attrition of productivity. When the Amoskeag ended all production in December 1935, it signaled the collapse of the economic base of a city of 75,000 people. Only a few of the structures survive as testament of the former Amoskeag Corporation.



The Lithograph is after a painting by John B. Bachelder, done in 1854. The artist strongly favors the tradition of placing the city in a bucolic landscape. At mid-century, it was still possible to do this because all the factories were on the eastern bank of the Merrimack, where the canal system was located. Steam powered mills were not put on the western side of the river until later in the century.

MANCHESTER,  
NEW HAMPSHIRE

1. Amoskeag Dam and Power House. Wing Dam constructed in 1871. Gate House constructed in 1909. Concrete Dam and Power House constructed 1920-1922.
2. Northern Division Steam Turbine Power House. Constructed 1909.
3. Manchester City Hall. Constructed in 1846. Architect: Edward Shaw. Modified slightly in 1876.
4. Manchester Print Works Storehouse. Constructed 1859. Southern ell added in 1875.
5. Manchester Print Works Corporate Housing. Constructed 1844-1850.
6. Amoskeag Mill No. 3. Constructed in 1870 on site of 1844 mill.
7. Site of Upper Canal and Wasteway. Completely filled in.
8. Amoskeag New Mills nos. 1, 2, and 6. Mills nos. 1 and 2 constructed in 1840. No. 6 completed in 1860. Roofs flattened about 1880.
9. Stark Mills No. 1 and 2 and center buildings. Mills 1 and 2 constructed in 1838. First of the large mills in Manchester. Center buildings completed about 1842. Roofs flattened about 1880.
10. Corporation housing, Stark and Amoskeag Mills about 1838-1860.
11. Site of Stark Mills #3 (1847-1882) and storehouse (1844).
12. Amory Mills. Constructed in 1879.
13. Langdon Mill #2. Constructed in 1868.
14. Jefferson Mill and Storehouse. Constructed in 1886.
15. New Bag Mill (Amoskeag Co.). Constructed in 1915.
16. Picker House. Constructed in 1881.
17. Lenticular Truss Canal Bridge. Erected about 1880.
18. Amoskeag Co. Picker House. Constructed 1880.
19. Amoskeag Co. Machine Shops. Constructed about 1880-90.
20. New Dye House, Amoskeag Co. Constructed about 1880.
21. Gingham Mill, Amoskeag Co. Constructed 1874.
22. Gingham Mill, Amoskeag Co. Constructed 1870.
23. Amoskeag Mills, nos. 4 and 5. Constructed 1900.
24. Manchester Print Works, Mill #3. Constructed 1880.
25. Manchester Print Works, Mill #2. Constructed 1850. Roof flattened and tower added, about 1880.
26. Manchester Print Works. Misc. Buildings, about 1876-1908.
27. Manchester Print Works, East Wing. Construction 1850. Modified in 1903.
28. Manchester Print Works, Miscellaneous buildings, about 1855-1920.
29. Manchester Print Works, Miscellaneous buildings, about 1897-1901.

From [Peter M. Molloy], Society for Industrial Archeology: Merrimack Valley Tour, [N. Andover, Merrimack Valley Textile Museum], 1976.

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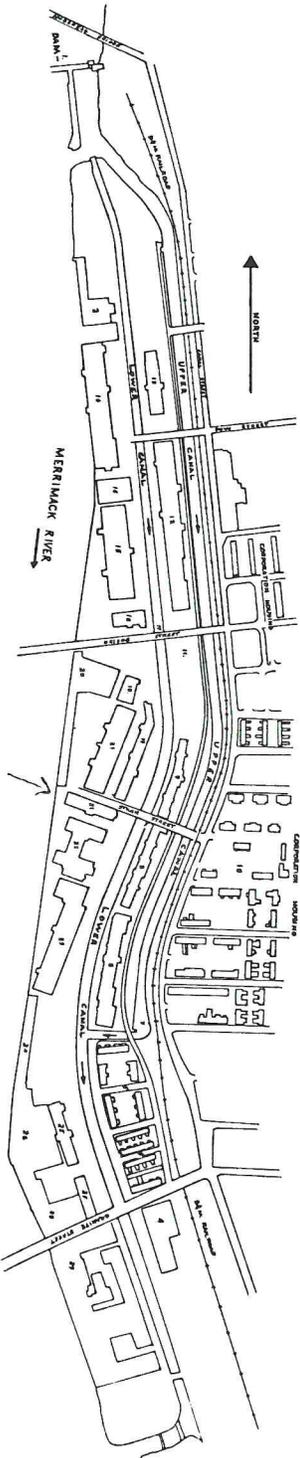
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